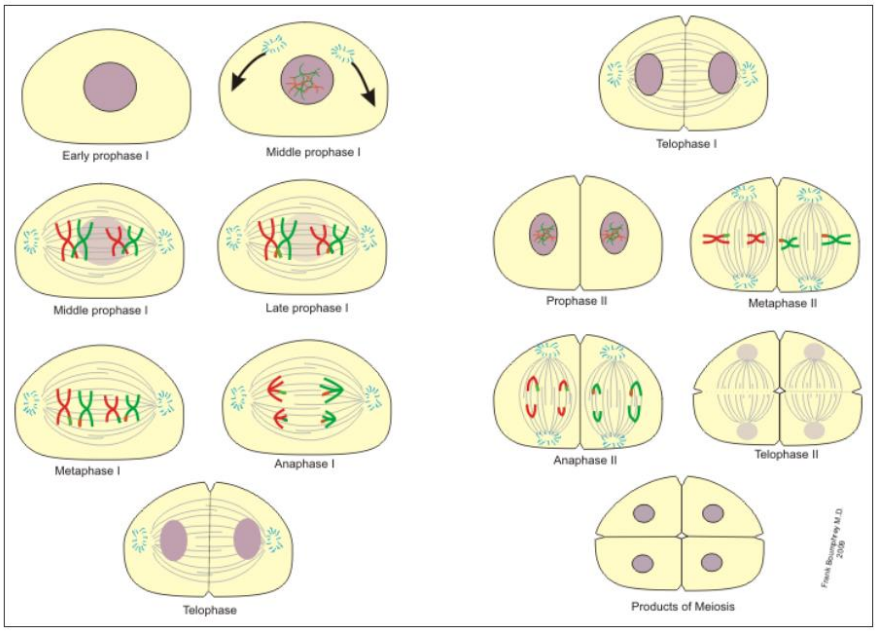
Meiosis & Genetic Variation

Genetic variation is increased by meiosis

During fertilization, 1 gamete from each parent combines to form a zygote. Because of recombination and independent assortment in meiosis, each gamete contains a different set of DNA. This produces a unique combination of genes in the resulting zygote.

Recombination or crossing over occurs during prophase I. Homologous chromosomes – 1 inherited from each parent – pair along their lengths, gene by gene. Breaks occur along the chromosomes, and they rejoin, trading some of their genes. The chromosomes now have genes in a unique combination.



Phases of meiosis

During meiosis, 1 diploid cell undergoes 2 cycles of cell division but only 1 round of DNA replication. The result is 4 haploid daughter cells known as gametes.

Independent assortment is the process where the chromosomes move randomly to separate poles during meiosis. A gamete will end up with 23 chromosomes after meiosis, but independent assortment means that each gamete will have 1 of many different combinations of chromosomes.

This reshuffling of genes into unique combinations increases the genetic variation in a population and explains the variation we see between siblings with the same parents.

Take a look at the video below to learn more:

https://www.youtube.com/watch?v=I5-WTHMHcyY&feature=emb_logo